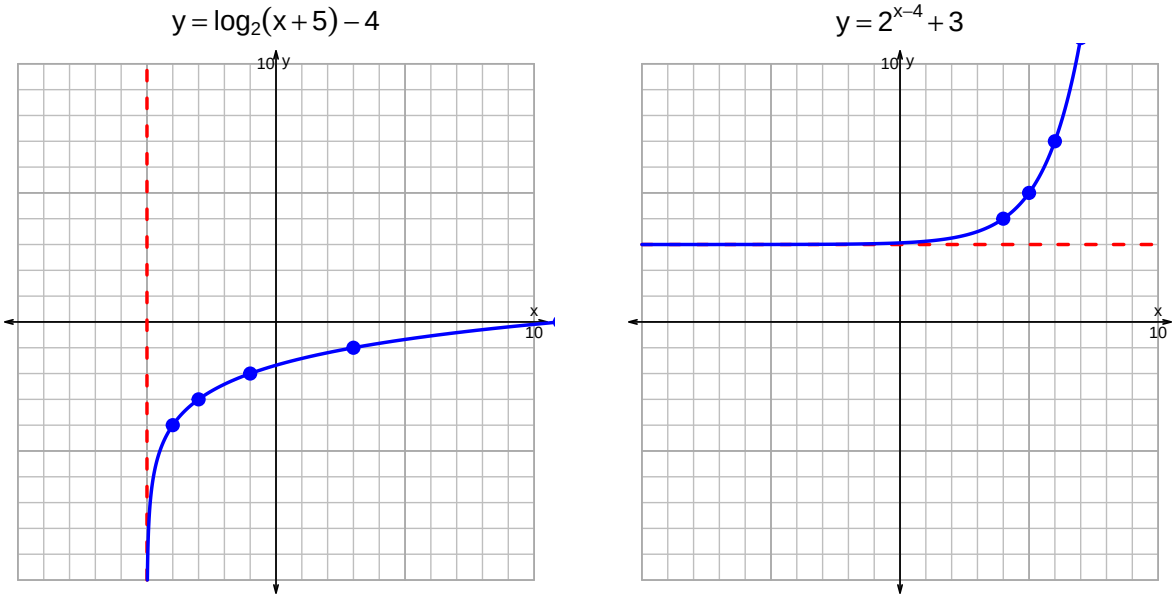
Name: Date:

s18quiz: EXP LOG (Solution v131)

1. Graph $y = \log_2(x+5) - 4$ and $y = 2^{x-4} + 3$ on the grids below. Also, draw any asymptotes with dotted lines.



2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-19 = \left(\frac{-5}{7}\right) \cdot 10^{3t/4}$$

Divide both sides by $\frac{-5}{7}$.

$$\frac{19 \cdot 7}{5} = 10^{3t/4}$$

Take log, base 10, of both sides.

$$\log_{10}\left(\frac{19 \cdot 7}{5}\right) = \frac{3t}{4}$$

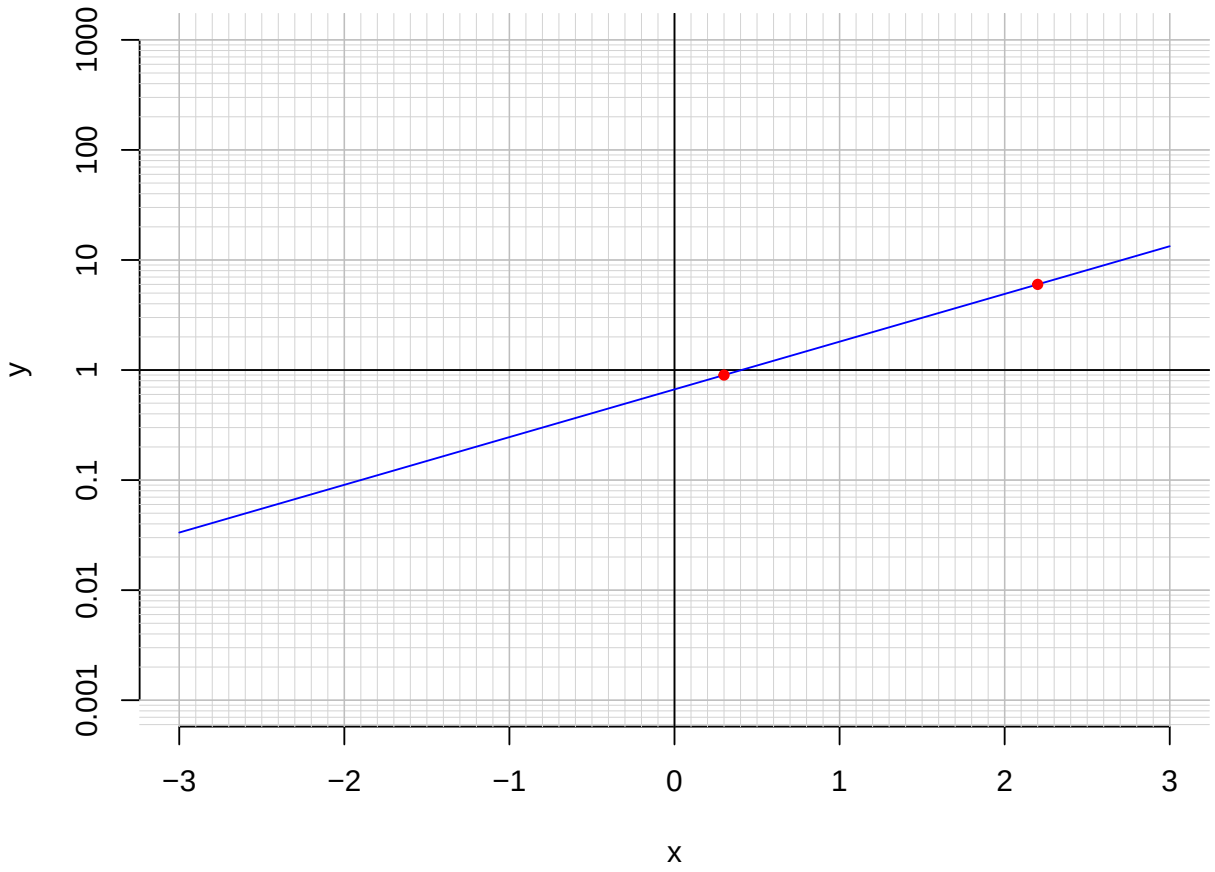
Divide both sides by $\frac{3}{4}$.

$$\frac{4}{3} \cdot \log_{10}\left(\frac{19 \cdot 7}{5}\right) = t$$

Switch sides.

$$t = \frac{4}{3} \cdot \log_{10}\left(\frac{19 \cdot 7}{5}\right)$$

3. An exponential function $f(x) = 0.667 \cdot e^{0.998x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(2.2)$.

$$f(2.2) = 6$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{1}{0.998} \cdot \ln\left(\frac{x}{0.667}\right)$$

c. Using the plot above, evaluate $f^{-1}(0.9)$.

$$f^{-1}(0.9) = 0.3$$